Abstract
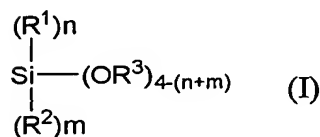
A coating composition for forming a silica-containing film comprises (A) a hydrolyzate and/or partially condensed product of a compound represented by the following general formula (I) and a compound represented by the following general formula (II):

$$\begin{array}{c} (R^1)n \\ | \\ Si\!\!-\!\!(OR^3)_{4\text{-}(n+m)} \quad (I) \\ | \\ (R^2)m \end{array}$$

wherein R^1 represents a hydrogen atom, an alkyl group or an aryl group; R^2 represents an organic group having an unsaturated bond; R^3 represents an alkyl group; n ranges from 0 to 2; m ranges from 1 to 3, provided that $0 \leqq n + m \leqq 3$; and

$$\begin{array}{c} (R^4)p \\ | \\ Si\!\!-\!\!(OR^6)_{4\text{-}(p+q)} \quad (II) \\ | \\ (R^5)q \end{array}$$
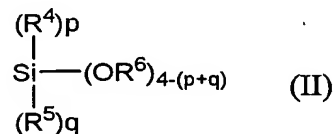
wherein R^4 represents an alkyl group or an aryl group; R^5 represents a hydrogen atom; R^6 represents an alkyl group; and p and q are integers satisfying the relation: $0 \leqq p + q \leqq 3$; (B) a solvent for coating; and (C) at least one member selected from the group consisting of a void-forming solvent, a compound having a polyalkylene oxide structure and hollow polymer fine particles. The silica-containing film obtained from the composition is excellent in the heat resistance, adhesive properties and resistance to cracking and has a low dielectric constant. Accordingly, the composition is suitable used as a material for forming an interlayer insulating film in the field of, for instance, semiconductor elements.